

MLDH-L / MLDH-P Type



General Features

Micro Long Drills are oil-hole drills for high efficiency drilling that were developed for drilling deep, small-diameter holes. These next-generation, small-diameter hole drills feature improved strength - often a problem area with small-diameter drills.

Characteristics and Applications

Deep-hole drilling

New groove shape ensures good drill rigidity and chip evacuation performance.

High efficiency drilling to depths of over 20x drill diameter at over $v_f=500\text{mm/min}$ (drill diameter 1.3mm, SUS416 equivalent).

Optimal thinning and edge balance for stable chip control.

Long tool life

Special coating provides long tool life with a wide variety of work materials.

Improved chip evacuation performance makes it possible to reduce spindle load fluctuation, ensuring stable tool life.

Series

Application	Series	Diameter Range (mm)	Hole Depth (l/D)	Remarks
Deep Hole Drilling	MLDH□□□□L5 Type	ø0.8 to 2.0	Up to 5	41 Models Stocked
	MLDH□□□□L12 Type	ø0.8 to 2.0	Up to 12	41 Models Stocked
	MLDH□□□□L20 Type	ø0.8 to 2.0	Up to 20	41 Models Stocked
	MLDH□□□□L30 Type	ø0.8 to 2.0	Up to 30	41 Models Stocked
Guide Hole Drilling	MLDH□□□□P Type	ø0.8 to 2.0	Up to 2	41 Models Stocked

Recommended Cutting Conditions

MLDH-P Type/MLDH-L5 Type

(v_c : Cutting Speed m/min f : Feed Rate mm/rev)

Drill Diameter ϕD_c (mm)	Cutting Conditions	Soft Steel Up to 200HB	General Steel Up to 250HB	Alloy Steel Up to 300HB	Stainless Steel Up to 200HB	Cast Iron FC/FCD	Aluminium Alloy	Heat-resistant steels
Up to 1.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
Up to 1.5	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.04 - 0.08 - 0.12	0.02 - 0.05 - 0.10	0.04 - 0.08 - 0.12	0.05 - 0.10 - 0.15	0.01 - 0.03 - 0.05
Up to 2.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.06 - 0.08 - 0.12	0.04 - 0.06 - 0.10	0.06 - 0.08 - 0.12	0.08 - 0.12 - 0.15	0.01 - 0.03 - 0.05

MLDH-L12 Type/MLDH-L20 Type/MLDH-L30 Type

Min. - Optimum - Max.

Drill Diameter ϕD_c (mm)	Cutting Conditions	Soft Steel Up to 200HB	General Steel Up to 250HB	Alloy Steel Up to 300HB	Stainless Steel Up to 200HB	Cast Iron FC/FCD	Aluminium Alloy	Heat-resistant steels
Up to 1.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.01 - 0.02 - 0.03	0.02 - 0.03 - 0.04	0.03 - 0.04 - 0.06	0.005 - 0.01 - 0.02
Up to 1.5	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.03 - 0.05 - 0.07	0.02 - 0.04 - 0.07	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03
Up to 2.0	v_c	40 - 50 - 60	40 - 50 - 60	40 - 50 - 60	20 - 30 - 40	40 - 50 - 60	50 - 60 - 70	5 - 10 - 15
	f	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.06 - 0.08	0.04 - 0.07 - 0.10	0.05 - 0.08 - 0.12	0.01 - 0.02 - 0.03

Min. - Optimum - Max.

Application Examples

Automotive Component Mould (Equivalent to SUS416)

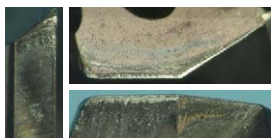
Tool : MLDH1400L20 (Guide : MLDH1400P)

Equipment : Vertical Machining Centre (HSKA63)

Coolant Supply : Internal Coolant (Emulsion Type, Pump Pressure : 4MPa)

Cutting Conditions : $v_c=60\text{m/min}$ $f=0.03\text{mm/rev}$ $H=21\text{mm}$

Tool Life : 600 Units (11.4m/reg)



Tooling Component (Equivalent to SKD11)

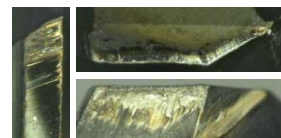
Tool : MLDH1900L20 (Guide : MLDH1900P)

Equipment : Vertical Machining Centre (HSKA63)

Coolant Supply : Internal Coolant (Emulsion Type, Pump Pressure : 4MPa)

Cutting Conditions : $v_c=60\text{m/min}$ $f=0.10\text{mm/rev}$ $H=27\text{mm}$

Tool Life : 600 Units (18m/reg)





MLDH-L / MLDH-P Type

Internal Coolant Supply

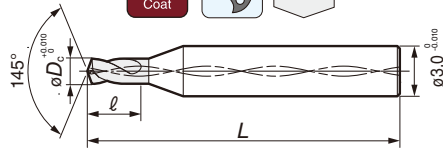
(MLDH-P Type / MLDH-L Type)

Carbon Steel, Alloy Steel	Tempered Steel	Hardened Steel	Stainless steel	Ti Alloy	Heat-resistant steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy	Copper alloy	Composite CFRP
Up to 0.28%	From 0.28%	Up to 45HRC	From 48HRC							

● MLDH-P Type

PVD
Coat

2D



● MLDH-L Type

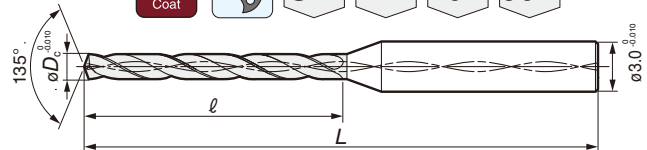
PVD
Coat

5D

12D

20D

30D



● MLDH-P Type/MLDH-L Type Dimensions and Stock Availability

Diameter øD _c (mm)	Dedicated Guide Hole MLDH-P Type				Micro Long Drill MLDH-L Type																
	Cat. No.	Stock	Dimensions (mm)		Cat. No. 5, 12, 20, 30	Hole Depth: 5D			Hole Depth: 12D			Hole Depth: 20D			Hole Depth: 30D						
						Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)		Stock	Dimensions (mm)					
			L	ℓ			5	L		ℓ	12		L	ℓ		20	L	ℓ	30	L	ℓ
0.80	MLDH 0800P	●	45	3.2	MLDH 0800L	●	50	8	●	55	14	●	60	19	●	70	28				
0.81	0810P	●		0810L	●	9		●	14		●	20		●							
0.82	0820P	●		0820L	●	●		●	●		●	20		●							
0.83	0830P	●		0830L	●	●		●	●		●	20		●							
0.84	0840P	●	3.4	0840L	●	●	●	●	●	●	●	●	●	●	●	●	29				
0.85	MLDH 0850P	●	45	3.4	MLDH 0850L	●	50	9	●	55	14	●	60	20	●	70	29				
0.86	0860P	●		0860L	●	●			●		●	●	●								
0.87	0870P	●		3.5	0870L	●			●		●	15	●	65	21			●	●		
0.88	0880P	●		0880L	●	●			●		●	●	●	●	●			●			
0.89	0890P	●	3.6	0890L	●	●	●	●	●	●	●	●	●	●	●	●	●				
0.90	MLDH 0900P	●	45	3.6	MLDH 0900L	●	50	9	●	55	15	●	65	22	●	75	31				
0.91	0910P	●		0910L	●	●		●	●		●	●									
0.92	0920P	●		3.7	0920L	●		10	●		60	16			●			●	●		
0.93	0930P	●		0930L	●	●			●			●			●			●			
0.94	0940P	●	3.8	0940L	●	●	●	●	●	●	●	●	23	●	●	●	32				
0.95	MLDH 0950P	●	45	3.8	MLDH 0950L	●	50	10	●	60	16	●	65	23	●	75	33				
0.96	0960P	●		0960L	●	●			●			●			●			●			
0.97	0970P	●		3.9	0970L	●			●			●			17			●	24	●	●
0.98	0980P	●		0980L	●	●			●			●			●			●	●	●	
0.99	0990P	●	4.0	0990L	●	●	●	●	●	●	●	●	24	●	●	●	34				
1.00	MLDH 1000P	●	45	4.0	MLDH 1000L	●	50	10	●	60	17	●	65	24	●	75	34				
1.05	1050P	●		4.2	1050L	●		●	●		18	●		25	●			36			
1.10	1100P	●		4.4	1100L	●		55	12		●	60		19	●			26	●	80	37
1.15	1150P	●		4.6	1150L	●					●			●	20			●	70	28	●
1.20	1200P	●	4.8	1200L	●	●	●	●	●	●	●	●	29	●	85	41					
1.25	MLDH 1250P	●	45	5.0	MLDH 1250L	●	55	14	●	65	21	●	70	30	●	85	43				
1.30	1300P	●		5.2	1300L	●			●		●	22		●	31			●	44		
1.35	1350P	●		5.4	1350L	●			●		●	23		●	32			●	46		
1.40	1400P	●		5.6	1400L	●			●		●	24		●	34			●	48		
1.45	1450P	●	5.8	1450L	●	●	●	16	●	25	●	35	●	90	49						
1.50	MLDH 1500P	●	45	6.0	MLDH 1500L	●	55	16	●	65	26	●	75	36	●	90	51				
1.55	1550P	●		6.2	1550L	●			●		●	27		●	37			●	53		
1.60	1600P	●		6.4	1600L	●			●		●	28		●	38			●	54		
1.65	1650P	●		6.6	1650L	●			60		18	●		70	29			●	40	●	56
1.70	1700P	●	6.8	1700L	●	●	●	29		●		41	●		100	58					
1.75	MLDH 1750P	●	50	7.0	MLDH 1750L	●	60	18	●	70	30	●	85	42	●	100	60				
1.80	1800P	●		7.2	1800L	●			●		●	31		●	43			●	61		
1.85	1850P	●		7.4	1850L	●			●		●	32		●	44			●	63		
1.90	1900P	●		7.6	1900L	●			●		●	32		●	46			●	103	65	
1.95	1950P	●	7.8	1950L	●	●	●	20	●	75	33	●	47	●	66						
2.00	MLDH 2000P	●	50	8.0	MLDH 2000L	●	60	20	●	75	34	●	90	48	●	103	68				

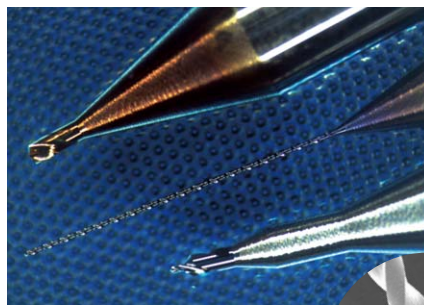
Grade: ACV70

Please indicate 5, 12, 20 or 30 in the when ordering.
(Example: MLDH 1000L20)

■ Made to Order Items: Inquire about production of drills in tool diameters and lengths not listed above or not in stock.

MDUS Type / MDSS Type

Very Small Diameter Drills for Very Small Hole Drilling & Telecom, Electronic Component, and Nozzle Applications

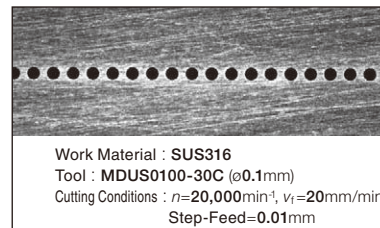
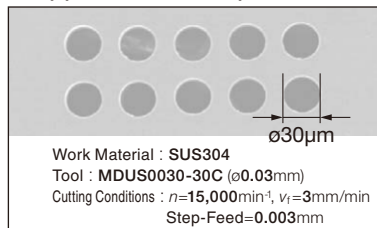


For Steel, Stainless Steel, and Other Metals

Micro MultiDrills MDUS Type $\phi 0.03\text{--}\phi 0.19\text{mm}$

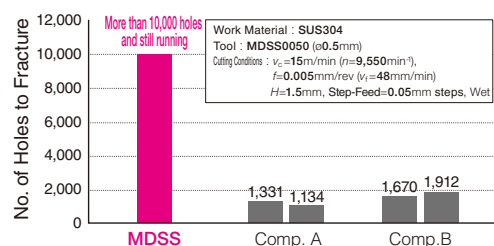
- High-precision shank !
Shank tolerance h3. Circularity 0.3 μm or less. Cylindricity of 0.5 μm or less.
- New ultra-thin TiAlN coating gives improved wear resistance.
- Perfect for steel, stainless steel, or copper machining.
- Available in sizes from $\phi 0.03\text{ mm}$ to $\phi 0.19\text{ mm}$ in 0.005 mm increments.

Application Examples



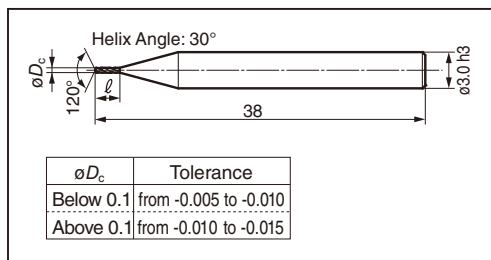
Solid Carbide MINI MULTIDRILLS MDSS Type $\phi 0.20\text{--}\phi 1.00\text{mm}$

- The combination of a hard, tough carbide substrate and a high rigidity design (web thickness, web thickness ratio, helix angle) greatly improves fracture resistance.
- PVD coating specifically for small drills significantly extends tool life.
- Suitable for a wide range of materials including carbon steel, alloy steel, die steel, and stainless steel.
- Shanks standardised to 3-mm diameter, 38-mm total length for greater ease of use.



Micro Multi Pointing Drill MDUP Type $\phi 0.03\text{--}\phi 0.18\text{mm}$

- For drilling guide holes with MDUS type drills

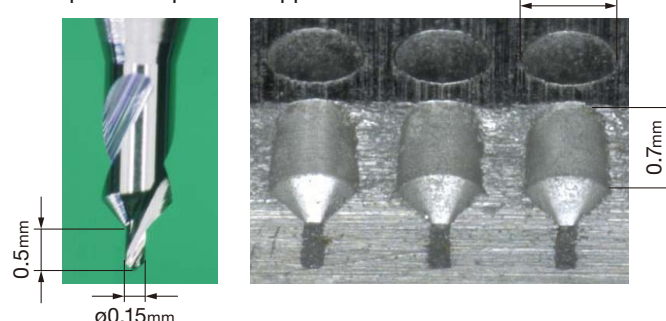


Diameter ϕD_c	Cat. No.	Stock	Flute Length ℓ	Pcs./Pack
0.03	MDUP 0030 to 30C	●	0.06	1
0.04	0040 to 30C	●	0.08	
0.05	0050 to 30C	●	0.1	
0.08	MDUP 0080 to 30C	●	0.1	
0.10	0100 to 30C	●	0.2	
0.12	MDUP 0120 to 30C	●	0.2	
0.15	0150 to 30C	●	0.2	
0.18	MDUP 0180 to 30C	●	0.3	

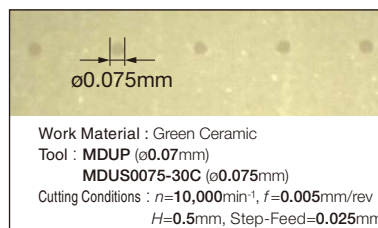
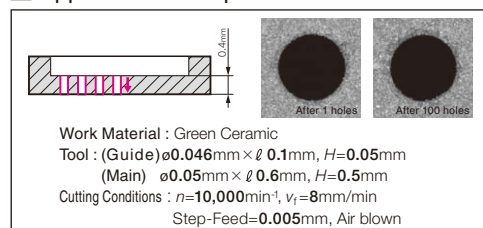
Made-to-Order Fine Drill $\phi 0.02\text{mm--}$

- Exclusive cutting edges are available for various work materials including non-metals, ceramics, and resins.
- Customized designs are also available for the improvement of efficiency, such as through the integration of processes by using a stepped drill.
- Various drill diameters (from $\phi 0.02$) and LxDs are available to order.
(Contact us for possible profiles.)

Example of Proposed Stepped Drill



Application Examples

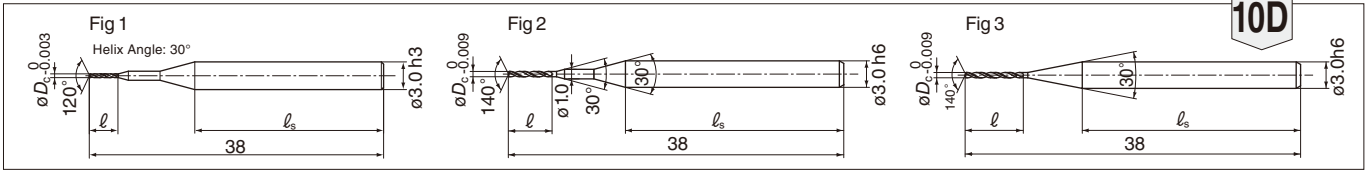


External Coolant Supply/Small Diameter

(MDUS Type / MDSS Type)

	Carbon Steel, Alloy Steel Up to 0.28%	Tempered Steel From 0.28%	Hardened Steel Up to 45HRC	Stainless steel From 45HRC	Ti Alloy	Heat-resistant steel	Cast Iron	Ductile Cast Iron	Aluminium Alloy	Copper alloy	Composite CFRP
MDUS	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎
MDSS	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

PVD Coat	FB Coat
MDUS Type	MDSS Type



● Diameter ø0.03 to ø0.49mm (mm)

Description	Tool Diameter øD _c	Cat. No.	Stock	Flute Length l	Shank Length l _s	Fig.	Pcs./ Pack
Micro MultiDrills MDUS Type	0.030	MDUS 0030-30C	●	0.3	28	1	5
	0.035	MDUS 0035-30C	●	0.4			
	0.040	0040-30C	●	0.5			
	0.045	MDUS 0045-30C	●	0.6			
	0.050	0050-30C	●	0.7			
	0.055	MDUS 0055-30C	●	0.8			
	0.060	0060-30C	●	1.0			
	0.065	MDUS 0065-30C	●	1.2			
	0.070	0070-30C	●	1.5			
	0.075	MDUS 0075-30C	●	1.8			
	0.080	0080-30C	●	1.9			
	0.085	MDUS 0085-30C	●	2.5			
	0.090	0090-30C	●	3			
	0.095	0095-30C	●	4			
	0.100	0100-30C	●	5			
	0.110	MDUS 0110-30C	●	28			
	0.120	0120-30C	●	28			
	0.130	MDUS 0130-30C	●	28			
	0.140	0140-30C	●	28			
	0.150	0150-30C	●	28			
MINI-MultiDrill MDSS Type	0.160	MDUS 0160-30C	●	28	2	3	1
	0.170	0170-30C	●	28			
	0.180	0180-30C	●	28			
	0.190	MDUS 0190-30C	●	28			
	0.20	MDSS 0020	●	28			
	0.21	0021	●	28			
	0.22	0022	●	28			
	0.23	0023	●	28			
	0.24	0024	●	28			
	0.25	0025	●	28			
	0.26	0026	●	28			
	0.27	0027	●	28			
	0.28	0028	●	28			
	0.29	0029	●	28			
	0.30	MDSS 0030	●	28			
	0.31	0031	●	28			
	0.32	0032	●	28			
	0.33	0033	●	28			
	0.34	0034	●	28			
	0.35	MDSS 0035	●	28			
	0.36	0036	●	28			
	0.37	0037	●	28			
	0.38	0038	●	28			
	0.39	0039	●	28			
	0.40	MDSS 0040	●	28			
	0.41	0041	●	28			
	0.42	0042	●	28			
	0.43	0043	●	28			
	0.44	0044	●	28			
	0.45	0045	●	28			
	0.46	0046	●	28			
	0.47	0047	●	28			
	0.48	0048	●	28			
	0.49	0049	●	28			

● Diameter ø0.50 to ø1.00mm (mm)

Description	Tool Diameter øD _c	Cat. No.	Stock	Flute Length l	Shank Length l _s	Fig.	Pcs./ Pack
MINI-MultiDrill MDSS Type	0.50	MDSS 0050	●	6	27	7	26
	0.51	0051	●	6	27		
	0.52	0052	●	6	27		
	0.53	0053	●	6	27		
	0.54	0054	●	6	27		
	0.55	0055	●	6	27		
	0.56	0056	●	6	27		
	0.57	0057	●	6	27		
	0.58	0058	●	6	27		
	0.59	0059	●	6	27		
	0.60	MDSS 0060	●	7	26		
	0.61	0061	●	7	26		
	0.62	0062	●	7	26		
	0.63	0063	●	7	26		
	0.64	0064	●	7	26		
	0.65	0065	●	7	26		
	0.66	0066	●	7	26		
	0.67	0067	●	7	26		
	0.68	0068	●	7	26		
	0.69	0069	●	7	26		
	0.70	MDSS 0070	●	9	24		
	0.71	0071	●	9	24		
	0.72	0072	●	9	24		
	0.73	0073	●	9	24		
	0.74	0074	●	9	24		
	0.75	0075	●	9	24		
	0.76	0076	●	9	24		
	0.77	0077	●	9	24		
	0.78	0078	●	9	24		
	0.79	0079	●	9	24		
	0.80	MDSS 0080	●	10	23		
	0.81	0081	●	10	23		
	0.82	0082	●	10	23		
	0.83	0083	●	10	23		
	0.84	0084	●	10	23		
	0.85	0085	●	10	23		
	0.86	0086	●	10	23		
	0.87	0087	●	10	23		
	0.88	0088	●	10	23		
	0.89	0089	●	10	23		
	0.90	MDSS 0090	●	11	22		
	0.91	0091	●	11	22		
	0.92	0092	●	11	22		
	0.93	0093	●	11	22		
	0.94	0094	●	11	22		
	0.95	0095	●	11	22		
	0.96	0096	●	11	22		
	0.97	0097	●	11	22		
	0.98	0098	●	11	22		
	0.99	0099	●	11	22		
	1.00	MDSS 0100	●	12	21		

■ MDSS Recommended Cutting Conditions (Wet) (Inquire about cutting conditions for the MDUS type)

Work Cond	Alloy Steel, Pre-hardened Steel SCM, NAK			Die Steel, Tempered Steel (30 to 40HRC)			Stainless Steel SUS		
	Rotation Speed min ⁻¹	Feed Rate mm/min	Step-feed (mm)	Rotation Speed min ⁻¹	Feed Rate mm/min	Step-feed (mm)	Rotation Speed min ⁻¹	Feed Rate mm/min	Step-feed (mm)
ø0.2	26,500	50	0.1D	21,200	40	0.1D	10,600	20	0.1D
ø0.3	26,500	80		21,200	60		10,600	30	
ø0.4	25,900	100		19,900	80		9,500	40	
ø0.5	25,500	150	0.2D to 0.5D*	19,100	110	0.2D to 0.5D*	9,500	50	
ø1.0	15,900	240		12,700	190		5,600	80	

- The above conditions are recommended under wet conditions, using water-soluble coolant.
- If machine noises and vibrations are present, please adjust the cutting conditions accordingly.
- If the machine cannot achieve the standard spindle speed, please use the max. spindle speed available. In this case, lower the feed rate by the same ratio.

* Step feed is recommended for drilling of holes deeper than 3xD.